Flight

First Aero Weekly in the World.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE AERO CLUB OF THE UNITED KINGDOM.

No. 24. Vol. I.] JUNE 12TH, 1909. [Registered at the G.P.O. as a Newspaper.] [Weekly. Price 1d. Post Free, 1½d.

Mr. Hubert Latham in full flight on his Antoinette monoplane on Saturday last at Chalons Camp, when he created a remarkable new record for this type of flyer by remaining in the air for 1h. 7m. 31s., maintaining a speed of about 50 miles per hour. Note the biplane on the ground, the occupants of which are carefully watching Mr. Latham's evolutions.

INVENTION, CAPITAL AND DESERT.

QUITE apart from inventiveness and leisure, there is a very essential thing before anyone can hope to fly. There must be the money either to buy, or to enable to be built, a machine; and if the commercial side of the matter has to be studied there must be additional funds to safeguard against infringement of any patent rights. On February 13th it was announced in FLIGHT that a register was about to be inaugurated by this journal with a view to assisting inventors and capitalists alike, by enabling the one class or the other to get in touch. A very considerable number of letters have continued to be received since that announcement was made, all of which have been filed and duly entered up under their respective headings. The result has been extremely encouraging, because it has proven to us that there was a real need for such a step as we took.

At the moment, however, our concern is with one aspect merely of this question. It arises out of the consideration of much of the material that has been sent in in connection with the register. Than ourselves none are more convinced that capitalists might, and even ought, to come forward in connection with the flying movement, if not for the good of the cause at least of that of the country. At the same time truth and the best interests of that cause compel us to be frank and state that a consideration of the situation, as revealed to us, shows that comparatively a very small percentage of those inventors who think that they can set the Thames on fire appear, from the best statements they can put forward in their letters to ourselves, to have anything really worthy of serious attention, or of risking capital upon. Inventors as a class are proverbially impracticable persons to deal with, and we fear that the more clamorous of those who concern themselves with the flying movement in the main present no marked exception to the rule. Too large a proportion of the communications of which we are in receipt are from, or are inspired by, inventors who are seeking money for carrying on work, most of these applicants having themselves not the haziest notion of the very considerable amount of cash that would be needed to carry out their ideas, or even to put them in a form for rational experiment.

We repeat that it is greatly to be desired that there may be no grudging of necessary capital to advance the flying movement in Britain. At the same time there is another side to the question. Capital employed to ill or useless purpose is detrimental to the best interests of the movement. Happily, so far there have been no alarming indications that the subject of aeronautics is to be seized on as a favourable opportunity for the company promoter, who, as a class, came mighty near ruining the automobile movement at the very outset. In the first place, too little is known about flight for even the company promoter to see any feasible opportunity at present for exploiting his ends by first allowing himself to be deceived by the over-sanguine inventor who has nothing more to learn in his own estimation, and by then passing on his alluring statements with fetching variations to the old women of both sexes, who usually form the bulk of the shareholders in such limited liability ventures. In the second place, the public, in Britain at any rate, has not had any evidence, good, bad, or indifferent, that is calculated to act on its imagination in such a fashion as to inspire confidence in the possibilities of aerial locomotion as a practical proposition. Of course, it is impossible to foretell what will be the results of the actual flights with heavier-than-air machines that will certainly be made by at least half-a-dozen different aviators in England before the summer is out. It may be that a section of the public will be so fired by them as to become over credulous, and therefore willing to support financially almost any invention for which bold and plausible claims are made by persons void of the rudiments of engineering knowledge, far less of the intricacies of aeronautics. If there is to be any appreciable raising of money through such circumstances, it will be a thing sorely to be regretted in the best interests of the new movement; for assuredly the ideal thing is that never a penny of capital, nor an ounce or a minute of effort, should be extended idly or vainly.

Our object at the moment is to emphasise that it is essential in the interests of all classes concerned with aeronautics that those who have money to invest should be warned as much against the impracticable type of inventor as against the company promoter. We all know the inventor whose only unmistakable sign of ability is the readiness with which he can advance limitless claims, and the tenacity with which he can adhere to statements that have oftentimes been evolved without even the rudiments of practical knowledge of the subject dealt with. It is plainly a matter of very urgent need at the moment that the majority of earnest students of flight should be furnished with some cheap and easily available means of learning, firstly, the precise nature of the functions and conditions with which it is necessary for any given invention in connection with flying machines to fulfil. It may not be realised that an enormous percentage of extraordinary inventive ingenuity is daily being dissipated on devising apparatus to achieve functions that are either the exact opposite of what the practical aeronaut has any need of, or are fulfilled automatically by the laws of nature. It stands to reason that thousands of clever brains that might be of the utmost service to the advancement of mechanical flight are possessed by men who have neither the means nor the leisure to make exhaustive and costly experiments. The result of much of this is to be found in a number of the inventions of the class that finds by far too large a proportion of the contributions to our register. One hardly knows how to overcome the difficulty at the moment. But printed matter must oftentimes be the chief means of instruction, and that is one of the great ends in view in the starting of the publication FLIGHT. It will be some years hence before any thoroughly practical handbooks of a reasonably cheap sort will be available for the student. Meantime we must urge all who are genuine in their intentions — and those who are not need look for scant encouragement at our hands—to find out precisely what it is desirable to achieve before they set their busy brains inventing ways and means. The wasting of energies to date is appalling, quite apart from the overlapping of effort. It is not so much that the time is out of joint as that many inventors unintentionally put themselves out of joint with the times. Perhaps it would be a good thing to establish another register wherefrom, before starting to invent a solution to some apparent problem, those who contemplate turning their attention to it should first write and ask whether what they believe to be necessary is really wanted at all. In a very great number of cases that would help inventors in a very much more practical way than would mere financial support—and long drawn-out failure—of their projects.

THE COMING OF THE MONOPLANE.

UNQUESTIONABLY the event of the week is Mr. Hugh Latham's remarkable series of successful flights on his Antoinette monoplane in France, and the fact that he has not only broken the record for distance, but has established a new record in the way of passenger flights more than ever gives one "furiously to think" about the type of flyer which he is using.

When reviewing the first Paris Aero Salon in the first number of FLIGHT, we particularly remarked upon the businesslike sporting appearance of the monoplanes there present, and prognosticated for them a most popular future if they should prove successful.

With many more pioneers of Mr. Latham's character the day of the single decker should arrive much earlier than there was at one time hope of expecting, but there are still some reasons for supposing that the development of its ultimate capabilities will still be a matter of fairly slow progress.

Sang-Froid in the Air.

The monoplane principle of construction very naturally associates itself in the mind with the idea of a small machine, but a small machine supporting the same load is aerodynamically restricted to flight at high speed, the popularising of which will, we imagine, hardly be forthcoming from aviators who lack anything of Mr. Latham's surpassing *sang-froid*. The pilot who lights a cigarette before starting and who shifts about on his seat to improve the balance when humming through the air at fifty miles an hour, is just the sort of man that is required to show the possibilities in higher speed still, and if it is true what Mr. Lanchester says, that the flight speeds of the future must for ultility exceed those of any other form of locomotion, then the sooner a suitable type is developed the better.

In the meantime, however, the moderate speed flyer is, we fancy, the vehicle which is going to attract the majority, and while weights remain what they are, the double deck will offer the most straightforward solution to the problem of construction. Even when the weights themselves are reduced, and the area of the supporting surface can be cut down to a fine limit, the advantage will affect both types in the same way, although should the saving ultimately found possible be a very large amount, the tendency to adopt the monoplane principle would naturally predominate.

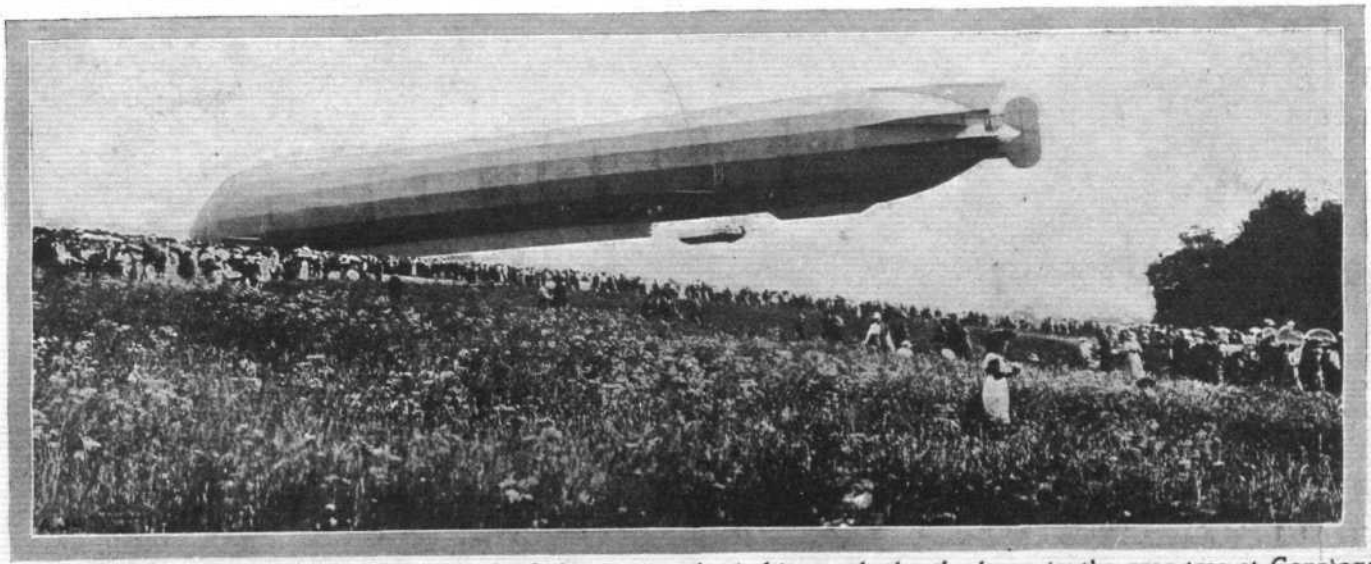
A Question of Speed.

The alternative course which can make the monoplane popular under present conditions is, as we have said, the general adoption of high speeds for flight, and that this should immediately come about is, we think, a matter of some doubt. The Antoinette monoplane which Mr. Latham uses can hardly be described as a small machine, but even with it, his average speed is in the order of fifty miles an hour. Now fifty miles an hour is no crawl, and if a somewhat extensive experience of motoring is any guide, there are quite a number of people who are apt to have a percentage of their normal wits blown away in the draught when travelling at or above this velocity through the air. With a motor car it is always open to anyone who does not feel quite at home when travelling fast to lead up to it gradually by going slowly at first, but an aeroplane will not fly at all unless it is forced through the air at the speed for which it is designed.

Under exceptionally favourable circumstances the aviator can provide himself with a flying ground on which he can get some sort of practice on *terra firma* itself, but such places are very few and far between in England, whatever they may be in France, and if starting off the ground is adopted, the necessity for keeping to moderate speeds with heavy weights is apparent.

The Use of the Rail.

With a starting rail such as is adopted by the brothers Wright, the possibilities of acceleration are totally altered, so there is no real bar to the determined pioneer who is bent on pushing up the speed of flight as near the limit as he can. On the other hand, the prospect of being fired into the blue at a muzzle velocity of a hundred feet a second or so may be none to enticing to the average would-be aviator, and although, as we have suggested, many men of Mr. Latham's calibre may be found having no hesitation about setting a fashion in this direction, for a while, at any rate, the real demand is likely to remain for flyers designed to fly at speeds more in the order of those usually averaged by the motor car. With this limitation, therefore, the prospect of evolving a successful small machine is more than ever related to the possibilities of obtaining a light engine of comparatively lower power. Higher speeds will mean higher powers in any case.



ZEPPELIN AIRSHIP MISHAP.—Photograph of the mammoth airship caught by the bows in the pear tree at Goppingen with the crowd watching the efforts to release the monster with as little damage as possible.

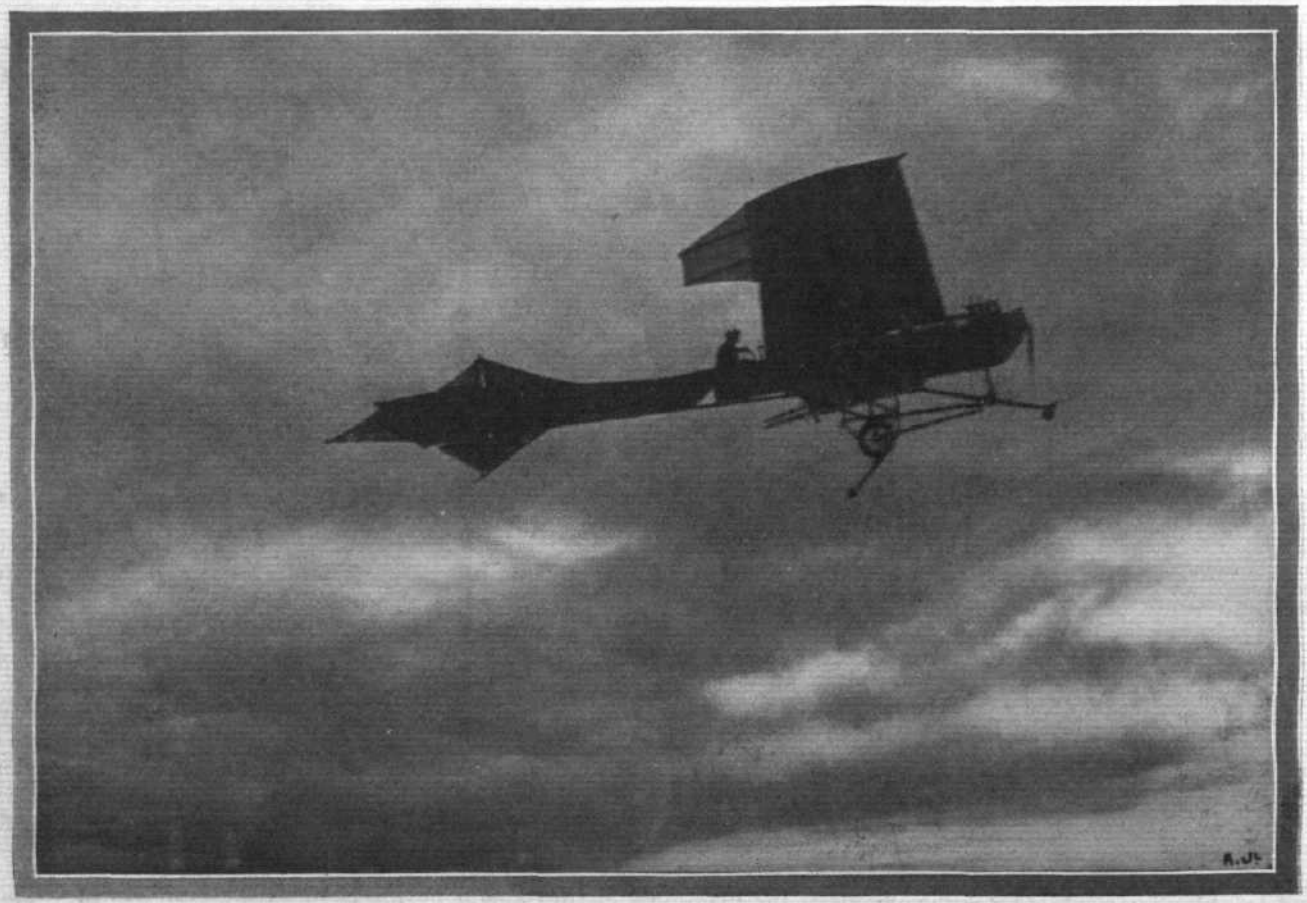
MONOPLANE WORLD'S RECORDS— REMARKABLE PROGRESS.

A FORTNIGHT ago we chronicled two records which had been made by Mr. Hubert Latham and M. Paul Tissandier respectively, and now we have to record a clean sweep made of those two records by Mr. Latham, who, by his latest performance, has placed himself second only to the Wright Brothers, and demonstrated in a wonderful manner the capabilities of that racing craft of the air—the monoplane type of machine.

After making his record flight of 37½ mins. on the 22nd ult., Mr. Latham was practising on his machine at Chalons Camp continually, but attempted nothing but short flights until the 4th inst., when he again flew for 37 mins. at a height of between 20 and 25 metres. He displayed the utmost *sang-froid* while making this little trip, and during the second circuit, while passing over the heads of the spectators, he calmly took his hands off the steering-wheel, rolled a cigarette and lighted it, thus creating a new record. He undoubtedly is the first man who has had the audacity to light and smoke a cigarette while in full flight.

On Saturday afternoon last, Mr. Hubert Latham once more brought out his "Antoinette" machine, and after making a couple of runs round the ground to see that everything was in order he rose into the air at 6.40 p.m. Rising steadily, he soon established himself at a height of about 15 metres, which was afterwards increased occasionally to 40 metres. He flew uninterruptedly, although the wind was blowing at a rate of 15 kiloms. an hour, for 1h. 7m. 37s., thus setting up a new world's record for monoplane flight and beating all French records for monoplanes or biplanes. Apart from the Wright Brothers, the records for long flights which have hitherto been made were held by Henry Farman, 20m. 19s. (July 6th, 1908); Delagrange, 29m. 54s. (August 6th, 1908); Paul Tissandier, 1h. 2m. (May 20th, 1909). Needless to say, the flight aroused the very greatest enthusiasm among the officers at the military camp, and by the time the flight was finished a very large crowd of spectators gathered, all wildly excited, despite the fact that the rain poured down during the last 20 mins. As soon as the monoplane came to earth, the young aviator was carried shoulder high to his shed by the crowd, and over one hundred officers at Mourmelon le Grand signed an official statement certifying to the length of the flight.

On Sunday evening last, Mr. Latham followed up this wonderful flight with another splendid one, when having entered for, he carried off, with remarkable ease, the Ambroise Goupy Prize, which called for a flight of 5 kiloms. across country. Starting from the Chalons Camp at 7.52 p.m., Mr. Latham turned the head of "Antoinette IV" towards Cadenay and flew in a straight line over trees and houses for 5·9 kiloms. in 4m. 3⅘s., at a speed of about 50 miles an hour. Turning round without coming to earth, he regained his starting point —another record—without incident, and was wildly cheered by an immense crowd of onlookers, numbering close on 600 people. M. Ernest Zens was the official observer at the start, while M. Paul Tissandier was at the turning point.



Mr. Hubert Latham flying with his Antoinette monoplane last Saturday at an altitude of about 100 ft., when he put up a new world's record.

A demonstration of the passenger-carrying possibilities of "Antoinette IV" was given by Mr. Latham on Monday evening, when he took up four of his friends for short flights. Capt. Burgeat, who also owns an Antoinette monoplane, was the first, and enjoyed a flight of 700 metres; Lieut. Charry was the second passenger; Mecanicien Cousin was the third, with a flight of 3 kiloms.; while the fourth was Mr. F. Hewartson, who had the longest flight of 11m. 57s, during which time about six miles were covered. During one of the turnings the wheel at the top of the left wing struck the ground, and a few minutes later the wheel fell off. Mr. Latham, on his attention being directed to it, stopped the motor and glided to the ground. During the last trip the wind was blowing in strong gusts, but Mr. Latham had complete control of the flyer.

A further exhibition of the gliding powers of the Antoinette monoplane was given on the following day, when Mr. Latham made two flights of 3 and 7 minutes respectively. At the conclusion of the second trip, when at a height of 10 metres, he switched off the ignition and glided to earth.

One result of these successful flights is to show that the art of navigating the air is by no means the exclusive property of a few men. Given properly designed machines, there is no lack of men with nerve and will who are capable of successfully manipulating them. The little band of aviators is ever widening, and it looks as if those who initiated the present heavier-than-air movement may be eclipsed by a newer and younger school. Santos Dumont, Henry Farman, Delagrange and Bleriot are at any rate being out-distanced by the newcomers, who, once the ball is set rolling, realise its immense possibilities, although no doubt they in their turn will in all probability be eclipsed by others in due course.

In view of this magnificent flight with a monoplane and M. Tissandier's with a Wright biplane it would appear as if the *Daily Mail* prize of £1,000 for a cross-Channel flight should be within measurable distance of being won. It is, in fact, announced that Mr. Latham intends to make it his next objective, and to that end is making preparations at once. Perhaps his successes will spur on other experimenters to immediate action in the hope of doing even better.

Mr. Hubert Latham, who last Saturday established a world's record by flying on his Antoinette monoplane for 1h. 7m. 31s.

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THE PILCHER GLIDER.

Two very interesting photographs are reproduced on this page of the glider upon which the late Mr. Pilcher met his death, while experimenting in 1899. By the courtesy of Mr. T. O'B. Hubbard, we are able to publish these, together with the measurements given below.

The machine has been recently repaired by Mr. Clarke. The following are the dimensions :—

Extreme width	24 ft. 8 ins.
Overall length	18 ,, 6 ,,
Main surface, extreme fore and aft	10 ,, 0 ,,
Area of main surface ... ... about	240 sq. ft.
Distance between main and tail surfaces ...	5 ft. 6 ins.
Area of horizontal tail...	5 sq. ft.
Area of vertical tail	2¼ ,,
Extreme breadth of horizontal tail	6 ft. 6 ins.
Fore and aft of horizontal tail	2 ,, 10 ,,
Height of vertical tail	2 ,, 10 ,,

The Pilcher Glider, in which Mr. Pilcher, on September 30th, 1899, met with his death, after having been successful in his early efforts at flying. In the photograph on the right Mrs. Tidswell, Mr. Pilcher's sister, who helped him considerably in his work, is standing by the tail of his machine. For these pictures and the accompanying information we are indebted to Mr. T. O'Brien Hubbard, the Assistant Secretary of the Aeronautical Society of Great Britain.

AERO CLUB OF THE UNITED KINGDOM.

OFFICIAL NOTICES TO MEMBERS.

Fixtures for 1909.

June 12 ... "Point-to-Point" Balloon Race, Hurlingham Club (Cup presented by the Hon. Mrs. Assheton Harbord).
July 10 ... Balloon Race, Hurlingham Club (Challenge Cup presented by Mr. Frank H. Butler).
July 17 ... "Hare and Hounds" Balloon Race, Hurlingham Club (Cup presented by the Hon. C. S. Rolls).
August 28 ... Gordon-Bennett Aviation Cup, Rheims.
October 10 ... Gordon-Bennett Balloon Race, Zurich.

Committee Meeting.

A meeting of the Committee was held on Tuesday, the 8th inst., when there were present: Mr. Roger W. Wallace, K.C., in the chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Mr. Martin Dale, Mr. John Dunville, Prof. A. K. Huntington, Mr. V. Ker-Seymer, Mr. F. K. McClean, Mr. J. T. C. Moore-Brabazon, Hon. C. S. Rolls, Mr. Stanley Spooner, H. E. Perrin (Secretary).

New Members.—The following new Members were elected :—

William Henry Allen.
H. Emory Chubb.
Capt. R. G Cooper-King.
Robert Esnault-Pelterie.
Francis Edward Fryer.
F. P. S. Harris.
Hamilton Hartridge.
V. A. Barrington Kennett.
Robert Loraine.
William Newsam McClean.
Capt. Cecil Paddon.
G. W. Phillips.
Philip Simons Picot.
Geoffrey de Holden Stone.
Robert Haden Tebb.
Frederick Tolley.
Arthur George Witherby.

Balloon Race, Hurlingham.
Point-to-Point Race (Cup Presented by the Hon. Mrs. Assheton Harbord).

This race will take place at the Hurlingham Club, Fulham, S.W., to-day, at 3.30 p.m.

Members of the Aero Club will be admitted to the Hurlingham Club free on presentation of their Aero Club Membership Cards.

Members of the Aero Club can obtain special tickets for the admission of their friends, who are not members of the Aero Club, to Hurlingham, from the Secretary of the Aero Club, price 10*s.* each.

The following balloons will compete :—

Competitor.	Balloon.	Pilot.
1. C. F. Pollock	Valkyrie ...	C. F. Pollock
2. C. A. Moreing	Thistledown	Prof. A. K. Huntington
3. Capt. G. J. M. Bagot-Chester	Satellite ...	John Dunville
4. Griffith Brewer	Lotus ...	Griffith Brewer
5. C. Moore-Brabazon ...	Uranus ...	J. T. C. Moore-Brabazon
6. T. Gerard Hetherington	Icarus ...	Maj. Sir A. Bannerman, Bart.
7. Hon. C. S. Rolls ...	Mercury ...	Hon. C. S. Rolls
8. F. K. McClean	Corona ...	F. K. McClean
9. Baroness von Heeckeren	L'Esperance	Maj. Baden-Powell
10. Mrs. John Dunville ...	La Mascotte	V. Ker-Seymer
11. Ernest C. Bucknall ...	Enchantress	Ernest C. Bucknall
12. B. H. Barrington Kennett	The Comet	B. H Barrington Kennett

Sailor-Aeronaut Race.

An invitation has been received from the Motor Yacht Club, whose headquarters are at the yacht "Enchantress," anchored of Netley Hospital, to the members of the Aero Club to compete in a Sailing Race on Saturday, June 26th, 1909.

The start will be made from the "Enchantress," and the 18 ft. one design sailing boats belonging to the Motor Yacht Club will be used for the race.

First prize and souvenir to crew, value £10. Presented by Mrs. Griffith Brewer.

Second prize and souvenir to crew, value £5. Presented by Mr. Frank H. Butler.

Members of the Motor Yacht Club and the Aero Club will be eligible to compete, subject to the following qualifications :—

1. Those who are members of both Clubs, *i.e.*, of the Motor Yacht Club and of the Aero Club.
2. Members of either Club who have made at least one ascent in a balloon or aeroplane.
3. Ladies, whether members of either Club and who have made at least one ascent in a balloon or aeroplane.

Members of the Aero Club will be honorary members of the Motor Yacht Club during their visit to the "Enchantress."

Entries are to be sent to Col. W. A. Jupp, secretary, Motor Yacht Club, "Enchantress," Netley Abbey; or Harold E. Perrin, secretary, Aero Club, 166, Piccadilly, London, W. Entries close at noon on the day of the race.

A train leaves Waterloo at 10.15 a.m. on Saturday, June 26th, arriving Southampton West at 11.53. The Club motor launches will leave the Town Quay at 12 o'clock and 12.45, bringing visitors and members to the "Enchantress" in time for lunch.

The one design sailing boats have a length of 18 ft., beam 5 ft. 9 in., depth 2 ft. 9 in., sail area 202 sq. ft.

Honorary Observers for Aeroplane Flight.

The following gentlemen have, at the invitation of the Committee of the Aero Club, kindly consented to act as Honorary Observers of Aeroplane Flights in connection with the various competitions and trials for records organised by the Aero Club :—

Lord Montagu.
Lord Northcliffe.
Field-Marshal Earl Roberts, V.C., K.G., K.P., G.C.B.
The Marquis de Mouzilly St. Mars.
Col. the Marquis of Tullibardine.
Major Baden-Powell.
Vice-Admiral Sir Charles Campbell, K.C.M.G., C.B., D.S.O.
Col. J. E. Capper, C.B., R.E.
Sir Claude Champion de Crespigny, Bart.
Commander Mansfield Cumming, R.N.
Count de Castillon de Saint-Victor.
E. P. Frost.
Admiral the Hon. Sir Edmund Fremantle, G.C.B., C.M.G.
Sir William Goff, Bart.
Sir Thomas Lipton, Bart., K.C.V.O.
Sir Hiram Maxim.
Sir Henry Norman, M.P.
Vice-Admiral George Neville, C.V.O.
Sir Arthur Paget, Bart.
C. D. Rose, M.P.
Lionel de Rothschild.
Sir David Salomons, Bart.
Admiral of the Fleet Sir Edward Seymour, G.C.B.
Hon. Arthur Stanley, M.P.
Col. Templer.
John E. Austin.

Shellbeach Flying Ground.

Erection of Sheds.—Members wishing to erect their own sheds at Shellbeach are requested to apply to the Secretary, who will supply all information.

Sleeping Accommodation at Shellbeach.—In order that the Committee may have some idea of the demand for sleeping accommodation at Shellbeach during the ensuing season, Members who are likely to require such accommodation are requested to notify the Secretary of the Aero Club forthwith. It is not necessary to specify any particular date at present, the object of this notice merely being to ascertain the probable demand for rooms.

Golf Course at Shellbeach.—The Committee of the Aero Club have under consideration the advisability of acquiring the golf course which immediately adjoins the flying ground at Shellbeach. Golfing members are therefore requested to notify the Secretary at once if they

are likely to make use of the course, so that the Committee may have some idea as to what support will be forthcoming.

Railway Arrangements.—The following reduced fares have been arranged with the railway company for members visiting Shellbeach :—

1st Class Return	2nd Class Return	3rd Class Return
8*s.*	6*s.* 6*d.*	5*s.*

These tickets will be available for one month from date of issue. Members desiring to avail themselves of these reduced fares are required to produce vouchers at the booking offices. Vouchers can be obtained from the Secretary of the Aero Club. Trains leave Victoria, Holborn, or St. Paul's.

For the convenience of members, the best train is the 9.45 a.m. from Victoria, arriving at Queenborough 10.55. At Queenborough change to the Sheppey Light Railway for Leysdown (Shellbeach), which is ¾-mile from the flying ground.

The Club House, Muscle Manor, is now open to members, and refreshments can be obtained there. Until the ground is being regularly used it is, however, advisable to send a telegram so that arrangements may be made. Telegrams should be addressed "Aero Club, Shellbeach, Eastchurch."

Members proposing to visit the Aero Club flying ground at Shellbeach are reminded that access to the aeroplane sheds or works can only be obtained with the consent of the owners of the flying machines.

Balloon Ascents in 1908.

During the year 1908, 203 ascents were made by members of the Aero Club, 652 passengers were carried, and 11,724,320 cubic feet of gas was used.

Hurlingham Club and the Aero Club.

Members of the Aero Club may be elected Associate Members of the Hurlingham Club on very favourable terms. Full particulars can be obtained on application to the Secretary of the Aero Club.

HAROLD E. PERRIN, Secretary.

The Aero Club of the United Kingdom,
166, Piccadilly, W.

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"NEW YORK WORLD" £2,000 PRIZE.

FROM the Aero Club of America we have received the latest rules and regulations, corrected up to April 7th, governing the competition for the prize of $10,000 offered by the *New York World*. The contest is open to any type of airship or flying machine, and the prize will be awarded to the competitor who flies from New York to Albany, a distance of about 142 miles. The following rules supersede those published in our issue of February 13th, 1909 :—

This contest will be held as a part of the official programme of the Hudson-Fulton Celebration in New York City from September 25th to October 9th, 1909.

A prize of $10,000 will be given to the winner of this contest, which is to be held under the rules of the International Aeronautic Federation and under the management of the Aero Club of America. The prize is donated by the *New York World* and is to the amount of $10,000 for the winner. The Aero Club of America reserves the right to give additional prizes for second and third places or for any special record as such prizes may be donated from such sources as are available.

The competition will take place on a day afterward to be decided upon by the committee in charge. The date will be during the period allotted for the celebration, and the committee in charge reserves the right to postpone the event to any subsequent date because of weather conditions, or for any other reasons which to the committee may seem sufficient.

All entries must be made in writing before July 1st, 1909, to the Aero Club of America, No. 12, East Forty-second Street, New York, and must be accompanied by an entrance fee of $200 in cash. Seventy-five per cent. of this entrance fee will be returned to actual starters. The Aero Club reserves the right to accept entries at its discretion up to September 1st, 1909, on payment of a $400 cash entrance fee, 75 per cent. of this amount being returned to actual starters.

The contest is open to all airships propelled by mechanical means without limitation of the power used or the mechanical principle involved. All airships entered must be mechanically propelled, and the Committee reserves the right to refuse permission to start to anyone who has not demonstrated his ability to handle his airship by having made at least three successful flights prior to this contest. No airship shall be allowed to enter the contest which has any connection with the earth or with any other vehicle or craft. Each airship shall carry at least one person. Each airship shall display a numbered pennant to be supplied by the Committee.

The starting line will be an imaginary line running through Governor's Island in an easterly and westerly direction, or some similar imaginary line designated by the Contest Committee. Competitors can cross this line any time within the limits of one hour as set by the Contest Committee, and their time will be taken, and the flight begun when they cross this line.

The finishing point will be a large open field, hereafter to be designated, in the neighbourhood of Albany, and the winner must land in the limits of the inclosure selected.

The length of the entire course will be reckoned in an air line from New York to Albany. Contestants are at liberty to follow the Hudson River or any other course they may desire within the limits designated.

Trials shall continue each day appointed by the Contest Committee between the dates fixed above (September 25th–October 9th, 1909) until the feat is accomplished.

Should more than one airship make the flight on any one day within the limit set the prize of $10,000 will be awarded to the one making the best time, the start being reckoned from the minute of crossing the imaginary line above referred to, and the finish when the pilot steps from his airship at the point referred to above. Should but one contestant succeed in making the flight, the prize will be awarded to him irrespective of the time consumed. The flight from the starting line to the finish at Albany must be made without landing.

Each contestant agrees in making his entry that he will abide by the decision of the Contest Committee of the Aero Club of America and waive all rights to contest in the courts any decision of the committee of the Club, or maintain any action in law or equity against the Aero Club of America or the Press Publishing Company. Each contestant for himself, his heirs and assigns expressly waives all claim for injuries either to himself or to his apparatus, and agrees to assume all liabilities for damages to third parties or their property, and to hold the Aero Club of America and the Press Publishing Company free and harmless therefrom.

The Contest Committee of the Aero Club shall be the sole judge of the suitability of the weather for the flight, and the Contest Committee reserves the right to postpone the contest on any day it may deem the weather to be unfavourable.

No member of the Contest Committee can take part in this event, either as aeronaut, assistant, or passenger. The contest will be conducted by the Special Committee to be named by the President of the Aero Club of America, who is ex-officio a member of this Special Committee, which shall embody the Contest Committee of the Club. No aeronaut, assistant, passenger, or owner of any contesting machine can serve on the Committee in charge of this event.

The committee reserves the right, with the consent of all the contestants entered, to change these rules in any particular which circumstances may render advisable. All questions not included in these rules will be decided by the rules of the International Aeronautic Federation.

The winner of the contest will receive the commemorative gold medal of the Aero Club of America, and the other competitors who accomplish the full course a silver medal of the Club.

Should the feat of sailing through the air from New York to Albany be accomplished prior to the Hudson-Fulton Celebration, the Contest Committee reserves the right to make such changes in the conditions as would make the winning of the prize an unprecedented feat or a record for distance.

Each competitor agrees not to exhibit any airship entered for this contest for money or prizes offered directly or indirectly by any other newspaper than the *New York World* prior to or during these contests.

NEWS OF THE WEEK.

De Rue Wins the Archdeacon Cup.

ON Sunday last the attraction at the Juvisy Aerodrome was an attempt by M. de Rue (a pseudonym, by the bye, which hides the identity of a prominent French aviator) to win the Archdeacon Cup, which is secured by the aviator who flies the longest distance, after having properly entered for the Cup. The entry has to state the time of starting, and the flight must commence within an hour and a half of that time. Santos Dumont was the first holder, and he was succeeded later by Farman and Delagrange. A strong wind was blowing at the time fixed for the start, and it was feared that M. de Rue would have to postpone his attempt; but just when the crowd were making a move for home, somewhat disappointed, M. de Rue mounted his Voisin machine, and at a height of about 10 metres made six and a half circuits of the course, marked out by two posts placed 500 metres apart, in 11 mins. 20 secs. Although the distance was officially only 6·5 kiloms., by reason of the wide turns which were made, it probably totalled to about 10 kiloms. M. Ernest Archdeacon, the donor of the Cup, which is of a value of 1,000 francs, was one of the official observers, being stationed at one of the two posts which defined the course. M. de Rue thus succeeds Delagrange as the holder of the Cup. The latter won it in February of last year with a flight of 3·9 kiloms.

M. Bleriot in a Ditch.

M. BLERIOT is having another spell of ill-luck. He has been endeavouring without success to make a record flight in connection with the inauguration of the monument at Toury marking his wonderful cross-country trip of last October. On Thursday he endeavoured to set up a speed record for monoplanes, but for some reason the motor came to a full stop and the machine landed suddenly in a ditch. M. Bleriot was uninjured.

On Monday M. Bleriot was out in his new monoplane No. 12 at Issy, and after short flights, made one of about 600 metres, carrying M. Andre Fournier as a passenger. He also made similar flights on the following day, the passenger being his mecanicien, Meslé. M. Bleriot proposes to attempt to carry two passengers shortly. M. Louis Barthou intends to make a flight with M. Bleriot in the near future.

Delagrange at Argentan.

FOR several days now Delagrange has been at Argentan practising with his biplane, and on Monday he made four short flights, but then had to suspend operations for the day as one of the wings struck a post and was damaged. Repairs were quickly executed, and the next day he made two circular flights of a kilometre. In attempting a third flight, the axle of the front wheels fractured, and so flying had to end for that day at least.

Gordon-Bennett Aviation Cup Course.

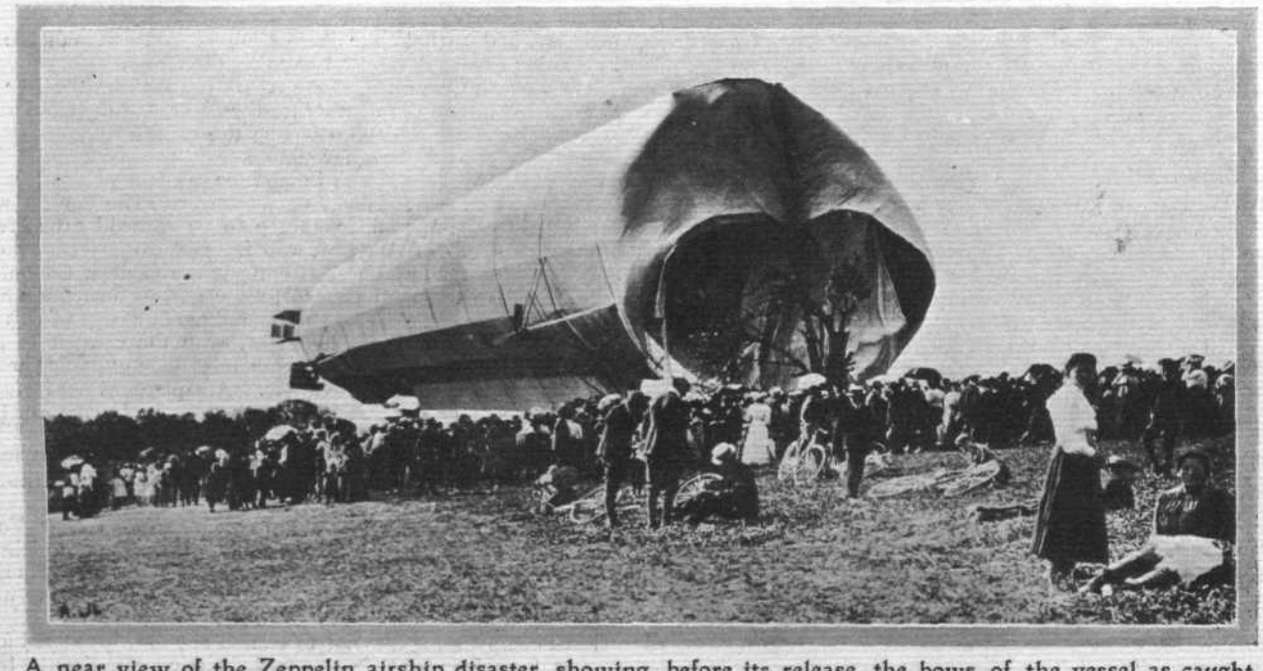
A LITTLE information is now available regarding the course which will be used for the events during the Champagne aviation week at Rheims. It will be marked out on the plains of Bétheny, taking the form of a rectangle, of which the long sides will measure 3·5 kiloms. and the short ones 1·5 kiloms, while at each corner will be erected a derrick 18 metres in height and painted red and blue to indicate the turning points to competitors.

At Port Aviation.

IN view of there being keen competition in the near future for records, the management at the Juvisy Aerodrome have marked out some new courses. They include one of 500 metres in a straight line, and circular courses of 1, 1½, and 3 kiloms. respectively. A number of new sheds have also been erected for the Wright and other flyers which are expected shortly.

A New French Aerodrome.

A LARGE tract of land, about 700 hectares in extent, situated at Croix d'Hins, about 23 kiloms. from Bordeaux, on the Arcachon Road, has been acquired by the Ligue Méridionale Aérienne, who propose to make it into an



A near view of the Zeppelin airship disaster, showing, before its release, the bows of the vessel as caught in the branches of the pear tree at Goppingen. On page 341, the airship is seen from the other end.

aerodrome. Hangars and repair workshops are being put up and it is proposed to instal an aerodynamic laboratory and a *station aerologique*. By way of opening the new flying ground, the prominent French aviators have been invited to a luncheon to be held there on Friday next, and the next day a distance competition for balloons will be held by the Aero Club du Sud Ouest.

Wright Brothers in Demand.

NOW that the Wright Brothers have achieved world-wide fame, they find they are in demand in their own country. An effort is being made to secure their presence at the aeronautical competitions which are to be held at St. Louis in connection with the centennial celebrations next October. The only difficulty is the Wright Brothers' engagements in Europe during September, and efforts are now being made to get them to postpone them.

Wright Flyer for U.S. Aeronautic Society.

ONE of the most energetic bodies which is endeavouring to stir up interest in the United States is the Aeronautic Society. In addition to their testing ground at the old Morris Park Race Track, where several machines are being experimented with by members, they have ordered an aeroplane of the "Silver Dart" type, and are also endeavouring to obtain one of the new Wright flyers, although, as may be imagined, competition for the first few which are now being built is exceedingly keen. It is hoped that should it be possible to secure one, either Wilbur or Orville Wright will instruct one of the members in its manipulation. The price is put at $7,500, and a similar sum is being paid for the Curtiss flyer, built on the lines of the successful "Silver Dart."

An Hungarian Biplane.

AN Hungarian inventor, Herr Alador Zoelgi, has just completed a biplane possessing a novel feature, for although it is built mainly on the lines of the Voisin machines, the tips of the wings can be flexed as on the Wright flyer. The aeroplane is 9 metres in width and also 9 metres in length, and has a lifting surface of 20 sq. metres. It is fitted with a Dutheil-Chalmers motor, and with the operator on board weighs 180 kilogs.

The French Government Subvention.

AT last the French Minister of Public Works has settled the knotty problem of the complete division of the Government subvention of 100,000 francs amongst the various societies in France. In our issue of May 8th, page 261, we stated that 43,000 francs had been allotted to the Aero Club of France, and this remains unaltered, but the 35,000 francs which it was suggested the Ligue Nationale should receive, has been increased to 38,000 francs. The offer of 5,000 francs to the Société Navigation Aérienne, subject to its being spent in a specified way, has now been ratified, and a grant of 5,000 francs made to the Automobile Club of France for the benefit of its aerodynamic laboratory at Levallois. A sum of 4,000 francs has been given to the Nancy Exposition, and the remaining 5,000 francs will be spent in various ways.

A portion of its 38,000 francs will be utilised by the Ligue Nationale to pay for the two Wright flyers which have been ordered, and to provide free instruction for the student pilots.

A 100-Kilom. Prize.

PARTICULARS regarding the conditions under which the prize of 10,000 francs offered by *La Nature* will be competed for have just been announced. The flyer will be required to start from a circle of 1 kilom. in radius and to land in a similar circle 100 kiloms. away in a straight line. Any competitor touching earth in the course of the flight, or who does not fulfil the conditions regarding the start and landing will be disqualified. Aviators who desire to compete for the cup must give three days' notice to the Ligue Nationale, stating the route it is proposed to take. If this route is more than 100 kiloms. from Paris, four days' notice must be given.

Two Prizes for 5 Kilom. Flights.

IT is announced by the Ligue Nationale that they have decided to use the 1,000 franc prizes offered by M. R. Gosselin and M. E. de Fontaines as awards for 5 kilom. flights in a closed circuit. The first will be competed for at Port Aviation, Juvisy, to-morrow, Sunday, while the second will be put up during the following month. Should there be more than one successful competitor, the prize will be awarded to the one making the best time.

N.E.C. Aero Engines.

ONE of the specially designed N.E.C. engines for aeroplanes should shortly be seen at work, Mr. Handley Page having just placed an order for a 4-cylinder one of 25-35-h.p., for an aeroplane which he is building.

Passenger Airships in France.

NOW that the military authorities of France are halting in the further acquisition of dirigibles, the question of utilising the Lebaudy organisation for building airships for passenger transport is receiving more attention, and it is stated by the Aerial League of France that within four or five months at the latest Parisians will be able to enjoy the novelty of an excursion by airship. It is proposed to start with five dirigibles, ranging from 3,500 to 7,000 cubic metres capacity, and capable of carrying from eight to twenty passengers in addition to the

Mr. Hubert Latham at the wheel of his Antoinette, after accomplishing his remarkable record flight on Saturday.

crew. The central dock for Paris will be at Issy, where two large sheds are nearly completed, and there will be four standard routes; that on the east will be to Nancy, with stations at Meaux and Rheims; to the south-east the terminus will be at Lyons, with stations at Juvisy and Fontainbleau; to the south-west Pau will be the destination, stopping intermediately at Orleans, Tours, and Bordeaux, while to the west Rouen will be reached. Hangars are being erected at all these places, and in some cases are already complete. No doubt in emergency this fleet of aircraft would be available for Government purposes at a moment's notice. With regard to fares, M. Rene Quinton, President of the Aerial League, thinks they will vary from £2 to £4 for a trip extending over thirty miles.

Dirigibles in U.S.A.

THE recent record-breaking flight by Count Zeppelin seems to have aroused a good deal of interest in military circles in the United States, and it is stated that Major Squier has been instructed to prepare a scheme for the aerial defence of the nation. It is suggested that at every 250 miles along the coast airship depôts should be established, and the dirigible stationed would have to patrol the zone within a radius of 125 miles. The equipment is also to include vertical searchlights, &c., as well as a number of aeroplanes for maintaining lines of communication. After the last little display in Congress when an appropriation for aeronautics was asked for, it would appear to be problematical as to whether the money will be voted for this big scheme.

U.S. Dirigible No. 1.

QUITE apart from the fact that they are hampered by lack of funds, the U.S. Army Signal Corps have many other difficulties to contend with. They recently inflated their Dirigible No. 1 at Washington, when a heavy thunderstorm sprang up, and blew down the tent which had been erected to receive the dirigible. Also, a bolt of lightning passed through the balloon-shed, going in one door and out the other, fortunately, as the *Scientific American* says, without igniting the hydrogen or injuring the officers present.

Ballooning Across Mont Blanc.

ON Whit Monday, the balloon "Helvetia," which, it will be remembered, was declared the winner of the Gordon-Bennett Balloon Race, made a notable performance by sailing across Mont Blanc. At times a speed of 63 miles an hour was obtained, and the balloon landed in the South of France after a trip of 370 miles. The envelope of the "Helvetia" is made of "Continental" material.

General Meeting of the Aerial League.

THE first annual general meeting of the Aerial League was held at the Carlton Hotel on Monday, when Capt. Cave-Brown-Cave occupied the chair. In proposing the adoption of the report, which dealt with the doings of the club since its recent formation, the chairman suggested that the public should be asked to subscribe £50,000 in order to purchase a Zeppelin airship which would serve as a model for British engineers to improve upon. Subject to his willingness to serve, Lord Roberts was elected president, and Major-General Arbuthnot, treasurer. Col. H. F. Massy was elected a vice-president.

Lectures in E. London.

THREE lectures on aeronautics are to be given at the East London College, Mile End Road, by Mr. A. P. Thurston, B.Sc., who was until recently assistant to Sir Hiram Maxim. The first, at which Sir Hiram Maxim will take the chair, on Monday next, 14th inst., will deal with the development of the aeroplane; the second, on Wednesday, 23rd inst., at which Sir C. N. Dalton will preside, will be devoted to balloons, dirigibles and kites; while the subject of the third lecture, at which Major Baden-Powell will be the chairman, on Wednesday, 30th inst., will be the mechanical principles of flight. The lectures will be illustrated by lantern slides, cinematograph views of various successful machines, models and experiments. In each case they will commence at 8 p.m., and tickets can be obtained from the Registrar of the college.

A Belgian Academy of Flight.

THE Aero Club du Hainaut have decided to establish at Mons a school for the study, theoretical and practical, of flight. A course of five lessons, including practical experience in the use of aeroplanes, has been arranged, and will commence as soon as the machines, which have been ordered, can be obtained. The fee for the course has been fixed at 125 francs, and the lectures on theory will be given by MM. A. Bracke and A. Jouveneau, while the practical experiments will be conducted by M. A. Scutenaire. A flying ground of about 30 acres in extent for the use of members of the club has been secured at the Castean Camp, and sheds and workshops are now being put up.

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HUMOUR FROM AUSTRALIA.

MR. WM. MAXWELL, one of our readers in Melbourne, in sending us his subscription for FLIGHT, also encloses a humorous cutting from one of the Australian papers, which we reproduce below, and concludes his letter in the following light vein :—

"There ought to be a great future for these skylarks, if developed on the wright lines; if so, they will come in useful in Australia, as we have no trans-continental railway, and they would do well travelling from the golden Victoria wheatfields to the Westralian goldfields, or in time of war, when all our Breadnoughts are gone, they would be admirable for decamping with far from the maddening crowd."

The enclosed cutting reads as follows :—

"At the City Court yesterday morning Wilbur Wright, an aeronaut, was charged with having flown on the wrong side of the sky. A second charge against the defendant of having exceeded the speed laid down in the traffic regulations, was heard at the same time.

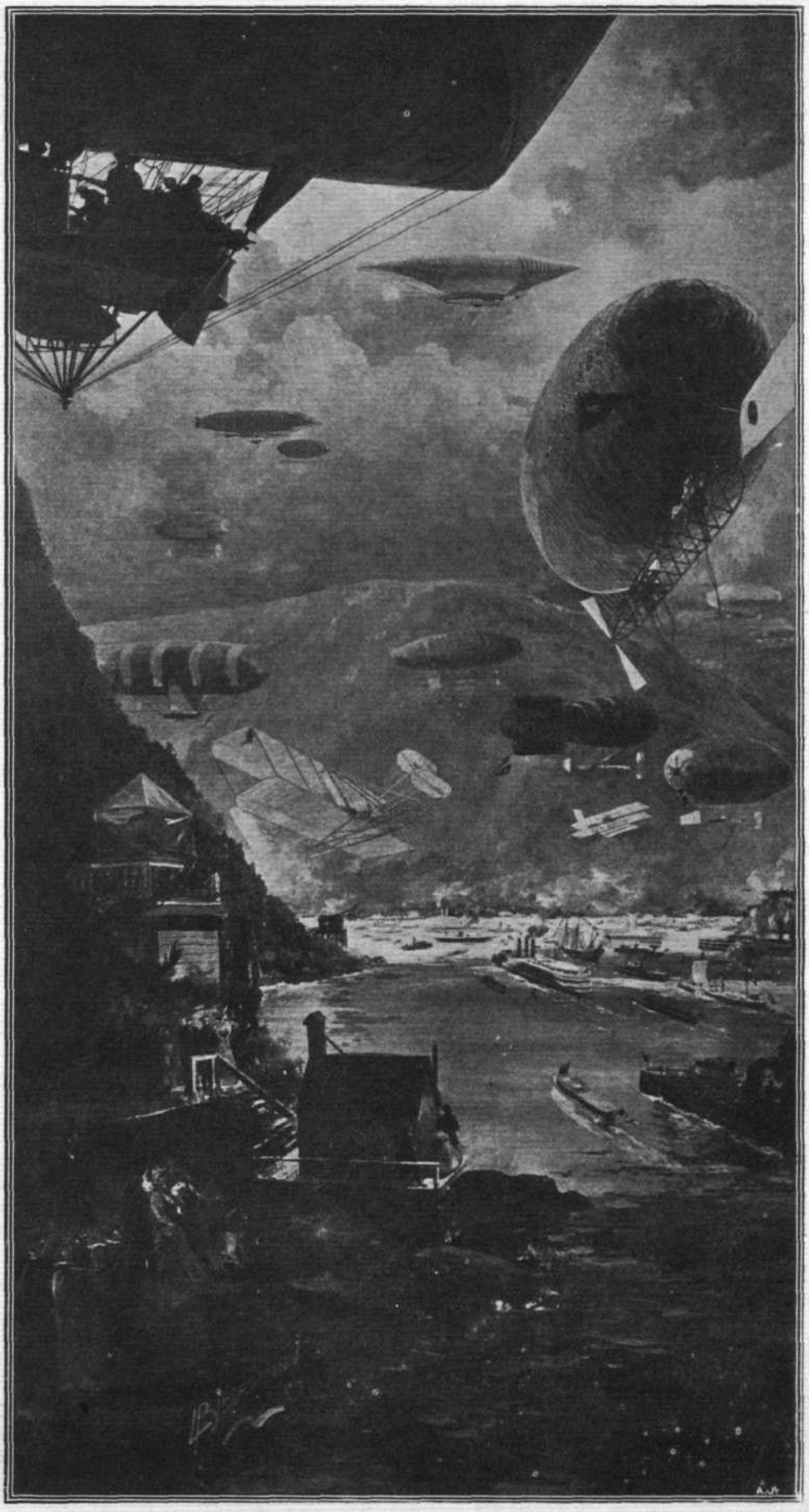
"Senior-constable Mulhaven gave evidence. He said :—'I was on patrol duty on my parachute, your Worship, near the south-east corner of the Southern Cross at 2 o'clock this morning. I saw the defendant approaching from the direction of the Pleiades at the rate of 74½ miles per hour. He narrowly escaped collision with two bats and a little brown boobook owl. He was on his wrong side of the sky.'

"Mr. Purves, who appeared for the defendant, said that his client was an amiable balloonatic, who would not wittingly offend against the regulations. He had swerved somewhat from his course to avoid an ascending soul.

"Evidence in support of counsel's statement was given by the defendant, but the Bench ruled that the defence was not sound in law. Souls had no right-of-way nor other legal rights in mundane courts, and defendant should not have altered his course. Wright was fined 10*s.* with 3*s.* 6*d.* costs."

NEW YORK TO ALBANY BY AIR.

"AIRSHIPS Passing West Point," a painting by Louis Biedermann, illustrates the possibilities of the contest of dirigible balloons, Sidney B. Bowman and Albert Triaca, with a Clement-Bayard air yacht, and Comte Henri de la Vaulx. Several types of French, German and American dirigibles are expected to be represented. There will also be in the Fulton Flight several aeroplanes, among them the new Herring-Curtiss machine and the Boker triplane. The artist's imagination has skilfully pictured the various types of air craft passing the United States Military Academy at West Point, while in the river below are seen the replica of Henry Hudson's "Half-Moon," presented by the Dutch Government, and the replica of Fulton's first steamboat, the "Clermont," escorted by war vessels and other craft.



It will be noticed that while the artist has included practically every type of dirigible, with the exception of the Zeppelin, only two aeroplanes, the Wright and the "Silver Dart," are portrayed as taking part in the flight. There are others!

On page 345 the full rules of the competition are given.

which we publish the latest rules this week, instituted by the *New York World*. The idea of the event depicted on this page is set forth in the following explanatory particulars issued by the organisers, the race forming one of the remarkable incidents which are being arranged in connection with the great Hudson-Fulton celebration in New York in September - October, 1909. The celebration commemorates the discovery of the Hudson River by Henry Hudson in 1609 and its navigation from New York to Albany by Robert Fulton in the first steamboat in 1807. The *New York World* has offered a $10,000 prize to the aerial navigator who duplicates in the air the 147-mile journey of Fulton's first steamboat, the "Clermont." Many sky-sailors have declared their intention of competing for the prize, among them Capt. Thomas Scott Baldwin and Roy Knabenshue with

NOTES ON PROPELLERS.

APROPOS of the subject of aerial propellers, on which we published an editorial article in connection with the Paris Salon in our issue of January 9th, Mr. Gerald Stoney, M.Inst.C.E, has been good enough to send us the following notes relating to propellers in general. Mr. Stoney, who is associated with the work of the Hon. C. A. Parsons, has had unique opportunities for studying the action of high-speed turbine-driven screws, not merely when they run in water, but also when they are used in air for colliery ventilation purposes. The following notes affect, it will be noticed, two or three of the leading queries which are most commonly propounded on this subject at the present day. One is, as to whether it is desirable to in any way shroud the blades, by putting a ring round them, in order to keep the air from flying off under centrifugal force; another is, as to whether any advantage might be expected to accrue from guiding the air to and from the propeller through a fixed casing; and the third is, as to whether wide blades are more advantageous than narrow ones.

Shrouding No Use.

Mr. Stoney writes as follows:—"In marine propellers it has been found that no sort of shrouding or ring round the blade tips, or the use of a coned propeller-chamber, or other guides either before or after the propeller, are much use, and what is universally used at sea is a simple propeller revolving as freely as possible in the water. The hull of the ship being so shaped as to allow it to be fed abundantly with water.

"In marine work the pitch co-efficient, that is, the ratio of pitch of propeller to diameter, is generally about 1·3 in slow-speed propellers, decreasing in high-speed propellers to about 0·9. It is also found that the slip should be about 10 to 20 per cent. for the most economical results.

"Two-bladed propellers have also in some cases proved more economical than ones with three or four blades, but are much more liable to cause vibration; so that three-bladed are almost universally used at sea, although in some cases where there is trouble with vibration good results have been obtained by substituting four-bladed for three-bladed.

Economy in Blades.

"As far as economy is concerned, however, two-bladed are probably the best. In slow-speed propellers, where cavitation does not come in, narrow blades are generally used; but in high-speed propellers, where cavitation is liable to take place, the width of blade has to be increased, until in some cases the projected area of the blades is equal to as much as 0·55 or 0·6 of the disc area. In the case, however, of aeroplane screws, it is quite evident that, as there is no such thing as cavitation in the air, narrow blades are the best; and it seems further, from experience at sea, that, unless the blades are very narrow indeed, the thrust depends largely on the disc area, and not on the width of the blades, so that narrow blades again should be most economical.

"The case of propeller fans such as are used in colleries driven by steam turbines, and fans used for other purposes, is quite different from that of a propeller of a ship or aeroplane revolving freely in the air. There it is required to draw from a shaft of a colliery or some other definite place, and therefore casing leading up to the propeller is necessary. Similarly suitably shaped casing to absorb the velocity of the air and turn it into pressure is beneficial on the outlet side of the propeller, but, as mentioned before, all such arrangements are useless when working in a free atmosphere or fluid."

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CLOTHS AND FABRICS FOR FLYERS.

AMONG the firms who are making a speciality of fabrics and cloths for use on flying machines, is included Messrs. Hutchinson, who have earned a high reputation for their pneumatic and other tyres. At present they are supplying four grades of double texture and five grades of single texture materials, and the fact that they have been adopted by the French Government testifies to the high quality of the fabrics. Egyptian cotton of the finest grade is used throughout. The finest specimen of the whole range is that which consists of an outer diagonal layer of cotton cloth, dyed yellow with chromate of lead to protect the rubber proofing from the sun's rays and a layer of rubber doubled with a straight layer of cloth, at an angle of 45 degrees, the latter also have a layer of rubber proofing.

This fabric is made 42 inches wide and weighs 9⅜ ozs. per square yard. The other double texture cloths are somewhat similar, but some are without the inner layer of rubber and some have the threads of the warp of both layers of cotton running parallel to each other. The lightest weighs 9 ozs. per square yard.

The single texture fabrics range from 2⅜ ozs. to 5⅛ ozs. per square yard in weight, some of them only having rubber on one side while others have it on both.

When these cloths were tested by the French Government small pieces 5 cm. wide and 20 cm. long were taken and the breaking strain was 840 kilogs. per metre both in the warp and weft. With regard to impermeability, specimens were taken off which allowed for a circular piece of 25 mm. in diameter. This, after being rubbed in the hands, was placed in the frame of a hydrogen gas cylinder and submitted to a pressure of 30 mm. of water for 24 hours, and the test stipulated that the loss should not exceed 10 degrees, each degree representing a loss of 1 cu. dm. per square metre. In the first trial the loss was only 3 degrees, in the second 5 degrees, in the third 4 degrees and in the fourth 3 degrees; in all cases being considerably less than the limit imposed.

Messr. Hutchinson have made a special study of the materials for these purposes, and can supply the above mentioned varieties from stock, but are prepared to make material suitable for any requirement.

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SOME POINTS IN AERONAUTICAL ENGINES.*

By A. J. McKINNEY, M.A.

THE engines used to-day in all types of flying machines are little more than motor car engines, considerably improved in some respects certainly, yet not so efficient in others.

There are four essentials for motors used in aeroplanes, and, indeed, all are really just as necessary in engines used for dirigibles. They are (1) lightness; (2) efficiency; (3) reliability; (4) automaticity.

A great deal of improvement has recently been made, suitable alloys making it possible to cast cylinders with very thin walls and pistons of fragile character, in each case with a fair certainty of success. Cast steel is as good as anything for the cylinders, but care must be taken to see that there are no blow-holes or flaws. The construction is much simplified by using copper or aluminium water-jackets, as the engine is easier to cast and to machine, while defects can hardly escape notice. Though a good deal has recently been heard in France of the good results given by steel pistons, it is better to use cast-iron when the cylinders are of steel, as the chance of a "seize" is then greatly minimised. Lightness of the reciprocating parts, the comparatively small size of the crank, and in some instances the absence of a fly-wheel, also help to reduce weight materially. Another important fact is the increase in the number of cylinders for any given output, *i.e.*, the recent practice of using eight or sixteen where formerly two or four would have been found. Then again, weight can be saved in the cradle or supporting arms, the transmission gearing and control arrangements, points which, however, hardly require treating here. In addition the aeronautical designer has this advantage over his *confrère*, in that his engines do not suffer from severe road-vibration or the strains due to traffic blocks, hills, etc. In the ignition and carburation systems a great improvement has recently been made in internal combustion engines. One can, of course, use a microscopic cell, *i.e.*, accumulator, and a midget coil, weighing together less than a quarter of those we had to employ three or four years ago. Or if high-tension magneto is preferred, there are several makes lately put on the market in which weight is considerably reduced. The fuel feed apparatus is another point, too, where much has been, and can still be, done in reducing weight without impairing efficiency. That system in which the petrol is injected direct into the combustion chamber once found a good deal of support, but while certainly having the advantage of lightness, it does not seem to give good results in practice. And where an atomiser or other external carburetting mechanism is employed, weight can be reduced considerably, both directly and indirectly. By the latter term I mean that, owing to increased efficiency of this agent, a quantity of fuel will go further, thus reducing the dead weight carried. I have already remarked that the ratio between weight and power is lessened by increasing the number of cylinders, so that we now have water-cooled engines weighing as little as 6 lbs. or so per b.h.p. as against their not very ancient predecessors whose weight-power ratio was as much, at times, as 20 and 25 to 1.

Of the three great incidentals, the lubrication, carburation, and cooling system, the former lends itself least of all, perhaps, to treatment with a view to weight reduction. Since an aeroplanist has not time to attend to such details of engine control during actual flight, automatic lubrication is a *sine qua non*, hence our efforts should be concentrated on evolving mechanism which should be as light and automatic as possible. Therefore we should make reservoirs of light metal as well as reducing their capacity to what is just sufficient for the trip, and, in addition, placing them as close to the motor as possible, so that only short feed pumps are necessary. If a force pump is used for the lubrication it, too, should be as small and light as can be managed without impairing its efficiency.

When we turn to carburation a great field lies before us. Personally, I am against fuel injection, since the liquid cannot possibly be atomised properly, while it is effectually prevented from diffusing through the air in the combustion chamber, owing to the infinitesimally short period that exists between its entry and its discharge through the exhaust valve. Knowing as we do that the diffusion of gases in the atmosphere is, at the best, a leisurely process even in the case of hydrogen, it is obvious that when a fuel is introduced neat into an engine there must be an enormous waste.

Of course, it burns, undergoing combustion of a sort, but the process is very imperfect and results in the discharge of unoxygenised petrol through the exhaust valve, and in a carbonaceous deposit on the piston heads, combustion chamber faces, and the sparking plug points. Soon, too, we find the engine overheating, to use a popular term, which leads to knocking, pre-ignition, and loss of power. Moreover, the rise in temperature is so pronounced as to cause the residual gases to expand enormously, which prevents the ingress of fresh air, as well as weakening the combustible material with inert gases left in the cylinder. The falling-off in power due to this cause leads to the operator—where he has the chance—giving the motor a larger supply of fuel, which, of course, only makes matters worse. In my own experience I have found the falling-off in power under these conditions to amount to as much as 20 per cent. of the normal b.h.p. while, what is worse, the engine can only run at a very high speed, which means it has to be run light—for when under load it bids fair to knock itself to pieces. At the best of times the fuel efficiency of light internal combustion engines is low enough already, and if we are going to decrease it still more by such crude methods as fuel injection, we increase the weight that must be carried as well as running up the expenses enormously. If one uses a good type of carburettor the results will be very satisfactory. There is one type, for instance, in which the spraying jet is in the centre of the float. The level of the fuel is thus but little affected when the carburettor is inclined.

Another of what may be termed the incidentals of the motor is the cooling system. Possibly I need not do more here than just mention that the temperature during the early part of the explosion stroke may be as high as 3,500° F., though probably it is not greater than two-thirds of this in high speed engines, as the initial compression pressure falls off considerably, owing to wire-drawing of the gases in the induction pipes and inlet ports. But even a temperature of 2,000° F. is too high for such a delicate piece of mechanism as a light motor of the kind we are considering. It gives rise to trouble with the lubrication and is likely to cause warping of the valve heads or stems, or even distortion of the cylinders. Some method of lowering the temperature is, therefore, essential even if we merely wish to avoid damaging the engine and are indifferent to its efficiency. And here we are brought face to face with two great alternative systems—air-cooling and water-cooling. Each of these has its ardent adherents, and each has its drawbacks. When air is used for cooling an engine it must pass over the cylinder heads with a certain velocity before it is of any use. This, of course, absorbs power—how much, depends a good deal on the system followed. On the other hand, water-cooling means a considerable increase in the weight of the engine, as the combustion chamber, at least, must have a double wall or external casing, with piping for the flow and return, while a radiator and reservoir are also required. In other words, with air-cooling we get lightness at the expense of power, while with water-cooling we obtain power, but handicap ourselves with increased weight.

As the average allowance for motor cars is about 1 or 2 lbs. per h.p., we cannot safely go much outside this limit. Hence we are bound, in some cases, to carry as dead weight ½ cwt. of water for an engine of 50-h.p.

Another point we have to remember, too, when considering water-cooling, is that we must have a pump to assist the water to flow through the engine, or if thermo-syphon or natural cooling is adopted, the quantity of water must be greater, either of which has an appreciable effect upon our total estimate.

There is a third method, little heard of, it is true, yet none the less very effective. It is what we might term internal cooling, the combustion temperature being lowered by admitting some agent such as water on the explosion stroke, and which, by reason of the change of state it undergoes, absorbs a good deal of heat. Having experimented on this point for six or seven years, I am convinced that, properly applied, water injection is of great value to high-speed internal combustion engines, especially where lightness is desirable. The same idea has been carried out for some years on slow-running engines such as the Gardner heavy oil motors, but its claims are apparently overlooked, or thought to be merely adding to an engine's complication by automobile engineers. Yet internal cooling is really quite simple, though I do not suppose aeronauts would care about the method followed some years ago in the Banki engine. In this case water was admitted through a special valve during the combustion stroke, a system, however, which is neither simple nor desirable. My own plan is to admit water to the inlet pipe during the induction stroke, *i.e.*, allowing the engine to suck it in with the fuel, when, of course, it is flashed into steam during the explosion stroke. The effect is to cure the harsh knocking sound one so often hears in an overheated engine, and, at the same time, to improve the indicator curve. Instead of the power falling off rapidly on this stroke—in the majority of light internal combustion engines the most effective part is the first two-sevenths—the piston received more of a prolonged "push," being, indeed, in a sense, steam driven. Personally, I do not find any marked increase in power at high engine speeds when using the

* Abstract of a Paper read before the Aeronautical Society of Great Britain on Friday, March 26, 1909.

water injection, but I do find a vast improvement in other ways. For instance, there was greater economy both in regard to fuel and lubricating oil. Then again, an air-cooled engine so treated can be kept running at full speed under load without the power falling off as is usually the case in this type after the first ten minutes or so. A well-known manufacturer of light motors, exhibiting at the recent Paris Aero Salon, even went so far as to admit to me that his air-cooled engines gave their nominal output for 10–15 minutes, but what happened after that he did not care to say. Hence the need for something more efficient. Messrs. Crossley made some interesting experiments some time back with internal cooling of this kind, and found they could use a compression as high as 200 lbs. per square inch without signs of pre-ignition. The mean effective pressure, too, worked out at 91·44 lbs. per square inch, and the thermal efficiency of 37·43 per cent. on the i.h.p. That these figures show the value of water injection can be seen when we recollect that very few engines exceed 65–80 lbs. compression, and then mostly in theory, as, under high speed-running conditions, it falls off considerably.

Something similar to the results of the Crossley experiment was found with the Banki oil engine. In 1900 one of these motors was the subject of a test of this kind, and a compression of 16½ atmospheres, *i.e.*, 240 lbs. or so per square inch, was quite feasible. The heat efficiency was 25 per cent., that of the average engine being about 20. In my own case I found that the quantity of water that gave the best results when introduced *via* the introduction pipe was approximately 1·85 oz. per minute for an engine of 30-b.h.p. The apparatus is very simple, being merely a small nozzle projecting into the induction pipe and coupled by a short length of small-bore rubber tubing to a reservoir. The whole need not weigh more than a few ounces, while the cost is negligible, and its action automatic. The reason one can be certain that water admitted into an inlet pipe will enter the engine is that the depression or suction there at high engine speeds is considerable. For example, a four-cylinder engine which was run at 800 r.p.m. induced a suctional effect at the throttle—when the throttle was open—equal to nearly 2½ inches of water. When the engine was accelerated to 1,040 r.p.m. the suctional pressure was increased by an inch. 1,200 r.p.m. gave a suction of 4½ inches of water on top gear, and as much as 6 on second. It is clear, then, that the velocity of the gases passing through the introduction pipes under these conditions is sufficient to carry along a fine stream of water such as that issuing from an orifice of less than 2 mm. in diameter.

Another device which makes air-cooling possible for high-powered engines is the auxiliary exhaust port. Small openings are made in the cylinder walls, which are just uncovered by the pistons at the end of their downward stroke, which has the effect of allowing the hot gases to get away easily. Two engines I experimented with kept much cooler, I found in one case an annoying knock, due to persistent overheating, disappearing completely. As I published my experience with exhaust ports some years ago, I need not do more here than briefly summarise the result. One I have already mentioned, the prevention of overheating. Another was to increase the number of revolutions per minute by 600–800, a third being an increase of torque by 12–15 per cent. at low engine speeds—say 400 or 500 per minute. The best shape for the port was, I found, rectangular, the length, in the line of piston travel being not more than 18 per cent. of the stroke—where this did not greatly exceed the bore. The width of the port might be 15 or 17 mm., but more than this was not advisable, as the ends of the piston rings are liable to catch in them and be broken off. Provision must, of course, be made against loss of lubricating oil, as it is blown out with the exhaust gases; also against taking in fresh air on the induction stroke, which is liable to upset the mixture. This, however, is a simple matter and is overcome satisfactorily in the Franklin engine, in which a valve is fitted to the auxiliary port.

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

EFFICIENT PROPELLERS—A CHALLENGE.

To the Editor of FLIGHT.

SIR,—I admire Mr. Cochrane's bold challenge and should like to try to win the £5.

Will Mr. Cochrane kindly state at how many revolutions per minute the motor runs when it develops ⅛-h.p., and is this the brake horse-power or the electrical horse-power taken in by the motor, and if the latter is the case will he please state the efficiency of the motor and oblige

Yours truly,
ALFRED WALKER.

To the Editor of FLIGHT.

SIR,—We are quite willing to take up Mr. W. Cochrane's challenge with reference to propellers in your issue of June 5th, page 338, but we do not quite see how we are to weigh the blades of our propellers without the boss, as they are all in one. We should therefore be glad to hear from your correspondent as to this matter. Also as to the place and date of the test, and who will be the independent person who is deputed to make the test.

We may add that we have just received the Gold Medal and Diploma of Honour for the Beedle Propeller in the Paris International Exhibition.

Yours faithfully,
THE WATFORD ENGINEERING WORKS,
Sole Manufacturers and Agents for the Beedle Aeroplane Propellers.

To the Editor of FLIGHT.

SIR,—I readily take up Mr. Cochrane's propeller-testing challenge, but he must produce a propeller of practicable size, as I have nothing to do with mere models.

Then again, why does Mr. Cochrane exclude the boss, which is, or should be, an integral part of the propeller, and may easily weigh more than the blades? Four feet diameter is about the minimum size for any useful purpose. Let Mr. Cochrane produce one of this size, and state *total* weight of it, and I am ready for him for a fair contest.

Playing about with *one-eighth of a horse-power* is of no practical use, and no diameter nor speed of this 5½-oz. (without boss) propeller is stated.

I should certainly like to hear something more explicit and definite about it, and doubtless others would also. What is its *total* weight, diameter, pitch, and speed?

Unless Mr. Cochrane states the *diameter* of his propeller—having a weight of 5½ ozs. for *blades only*—and its *total* weight, how is one to know whether he can produce one of less weight and greater structural strength for its size?

I presume he knows that the weight of a larger propeller will increase as the cube of its linear dimensions?

Yours faithfully,
York, June 7th. SIDNEY H. HOLLANDS.

THE CARRON MODEL.

To the Editor of FLIGHT.

SIR,—Although the design shown by M. Carron in your issue of May 29th, as you say, is not new, the arrangement of the surface as there shown is the most efficient that up to the present has been devised for sustaining a weight. At the same time, I doubt very much if so large an area of efficient surface can be put in a frame 4 metres by 2, as there mentioned. In the experiments carried out by my father, Mr. H. Phillips, at Harrow, in 1893, an account of which appeared in *Engineering*, March 10th, May 5th and 19th of that year, the surfaces used were 1½ ins. wide, placed 2 ins. apart in a transverse vertical frame 18 ft. by 8 ft. In some later experiments that were carried out with a fan blast, I came to the conclusion that 3 ins. apart would have been a better distance than 2 ins. for surfaces of the section and width, viz., 1½ ins., that were used. These surfaces were made with a hollow $\frac{1}{16}$ in. deep on the underside, while the highest part of the convex top was placed one-third from the leading edge, the material itself—pine—being $\frac{1}{16}$ in. thick. There is no sense in crowding the surfaces together with the idea of getting so much more lift, considering the fact that it is the weight of air dealt with that is the chief consideration, and only so far as the surfaces act on this weight in an efficient manner are they worth having. I mention this as in most accounts of machines built or building the area of surface is often given as though it were of primary importance, but the fact of spreading out a large surface does not necessarily make a flyer.

One of the first experiments I remember was with a model very like the one shown in FLIGHT some weeks back, made by Sir George Cayley. It was shot off a guide by springs, it had a weight attached to it somewhere near the leading edge, on being released it invariably took a curve upward, then as the speed lessened, turned to the horizontal and finally came down nose first. This proved two things, viz., that the surface was more efficient towards the leading edge, also that the centre of pressure of lift varied; at the higher speed it was in front of, and at the lower behind, the centre of gravity. Now if these two facts are thoroughly

appreciated, viz., the necessity of dealing with a sufficient weight of air, also that an area of surface arranged in somewhat narrow strips is more efficient for the purpose, it appears to me to be self-evident what aspect the sustainer should take to make the most effective weight carrier.

Suppose we imagine a sustainer built on this "venetian blind" principle, and see what it is capable of doing. Say the frame is 40 ft. wide by 20 ft. high, and the speed 60 ft. per sec., the weight of air dealt with in this time will be approximately 3,840 lbs. ; taking the downward speed imparted to that weight as 7 ft. per sec. then the reaction or lift will be about 834 lbs., the horse-power being expended to maintain the load. Under these conditions, being $5\frac{1}{2}$, it takes no account of any other resistance. If, as I suggest, the surfaces be placed 3 ins. apart, we shall have an efficient area of 400 sq. ft., the weight carried being something over 2 lbs. per sq. ft.

For the sake of transverse stability in turning, it appears to me that the sustaining surfaces should be arched transversely, the ends curving downwards, more particularly in a system where the centre of gravity is kept low. This suggestion may not be new, although I have not seen it put forward before, but I consider it of some importance. Such a frame of sustainers, by careful design and workmanship, should not weigh more than about 75 lbs., and I should like the task of building one.

In a most interesting paper, read by Mr. Wenham and published in the first annual report of the Aeronautical Society, in speaking of a gull that was following in the wake of the vessel he was travelling on, exclaims : But where is the angle or inclination of his wings to counteract his falling tendency? for to all appearance his wings are edgewise or parallel to his line of motion, and he appears to glide along a frictionless support, &c.

This goes to show that the angle was small, and I am not altogether certain that a line drawn from the front to back edge should show any angle at all with these narrow concavo-convex surfaces when in flight.

In machines built on the monoplane system we have an extreme type ; with the "venetian blind" system we have the other extreme. I have no doubt in my own mind which is the more efficient.

I do not wish to pose as an expert, who, while doing little or nothing successfully himself, undertakes to teach others how to do it ; but, as a mechanic who has had somewhat exceptional opportunities of assisting at experiments, I feel certain that machines built on the monoplane and biplane system are not the best that can be designed, and to those about to experiment in this direction I would say, study the subject, and think, not blindly follow, simply because one or two others lead.

Yours truly,

Shepherd's Bush. F. H. PHILLIPS.

TO ENCOURAGE PIONEER AVIATORS.

To the Editor of FLIGHT.

SIR,—No doubt a number of your readers will wonder what English aeroplane builders are doing. As far as I am aware they are pushing ahead with all possible speed, although much pioneer work has been done abroad, and in England there still remains much to be done.

One would naturally think after an aeroplane is built, all the aviator had to do was to start up the engine, run along the ground and into the air. But, however carefully an aeroplane has been designed and built, it takes considerable time for adjusting, practising, &c., as all sorts of unforeseen delays keep constantly cropping up, and to even make the first step, namely, to obtain sufficient speed to rise, may run into months.

As the pioneer has naturally so many difficulties to overcome, and as he paves the way for those who follow, I think he ought to be encouraged by prizes for the first steps. True the *Daily Mail* have very generously offered £1,000 for a mile circular flight, but I think smaller efforts should also be encouraged. I suggest prizes could be offered to British-built aeroplanes accomplishing the following :—

1. First aeroplane to run along an ordinary field at 25 m.p.h.
2. Fly 100 yds.
3. $\frac{1}{4}$ mile.
4. $\frac{1}{2}$ mile.
5. For the aeroplane that flies with the smallest h.p. engine.
6. The lightest aeroplane.
7. The smallest span.
8. Most portable aeroplane.
9. The slowest aeroplane.
10. Fastest aeroplane.
11. The aeroplane with greatest range of speed, that is, slow or fast.

If a rapid growth of the movement is desired, then the small aeroplane with small horse-power should be encouraged above all, for I fear only a limited few will go in for the costly high-powered heavy aeroplanes. Personally I think the *Daily Mail* £10,000 will be won by a small, light, handy aeroplane of small horse-power, capable of travelling at speeds ranging from 25 to 40 m.p.h.

Yours faithfully,

A. V. ROE.

P.S.—If any of your readers are on the look-out for a smooth large trial ground, I know of a place within 10 miles of London ; there is also an aeroplane shed available adjoining ground, measuring 36 ft. wide, 12 ft. high doors, and 40 ft. long.—A.V.R.

FLAPPING-WING MACHINES.

To the Editor of FLIGHT.

SIR,—As a devotee of many years' standing to the study of aviation—including many and varied experiments in aerodynamics—half a lifetime of fifty years, in fact, with a good slice of that period devoted to flapping-flight, I am desirous of offering a few comments on the subject of the article "Flapping-wing Flight," published in your issue of 29th ult.

Let me premise that I am sanguine as to the ultimate success, and general use, of ornithoptères and analogous winged machines, but, in my belief, success most certainly will *not* be achieved by means of any system of "valvular" wings.

As long ago as 1884, my esteemed and lamented friend, the late Mr. Brearey (B.Sc., &c.), joint founder of the Aeronautical Society—and second to none in a profound knowledge of the subject—alluded to "that exploded fallacy of valvular wing action" ; thus we see it was "blown up" over a quarter of a century ago.

Such hypothetical valvular action not only certainly does *not* occur in natural flight—and is therefore not essential to it—but many experiments have demonstrated that it is equally futile in schemes of aviation. The membraneous-winged flying mammals and insects bear indisputable witness that it is not essential nor used at all.

It must, however, be conceded that it is a plausible hypothesis, and it is due to this plausibility that, like many experimenters before and since, my early essays (in 1880) were in that direction, but I soon realised its futility.

Shortly after that period, becoming acquainted with Mr. Brearey on joining the Aeronautical Society in 1883, I had the support of his valuable experience and testimony to the entire discredit of valvular wing action.

It is much to be deprecated that the writer of the article should seriously entertain this chimera, much more advocate it as a likely means of practical flight, and it is also surprising.

It is misleading, and calculated to induce novices to waste much valuable time on a long discarded and fruitless line of experiment.

The writer talks too about "the idle stroke"! Does he not know that there is *no* idle stroke in natural flight, and that there need not be in artificial flight? The upstroke of the wing has its functions as well as the downstroke.

Yours faithfully,

York. SIDNEY H. HOLLANDS.

[The article in question was written solely for the purpose of drawing specific attention to the difficulty and drawbacks of a principle which is often brought up for discussion ; there was no intention of advocating its adoption by experimenters—rather the converse.—ED.]

BRITISH INVENTIONS AND FOREIGN ENCOURAGEMENT.

To the Editor of FLIGHT.

SIR,—In reply to your various correspondents who have taken exception to my remark *re* capitalists, I must say that their ideas as to what a capitalist is seem rather foggy. What they all appear to be looking for is a speculator, which is a very different thing and no doubt hard to find. Mr. Maxwell also appears to think that investment and speculation are synonymous.

If Messrs. Foster and Maxwell would disabuse their minds of the idea that they are offering subjects for investment when they are only bringing forward schemes for speculation, they would begin to understand the (to them) incomprehensible shyness of the moneyed individual. I may remark here that Mr. Maxwell's correspondent who "wanted the earth" for his paltry £50 is not a specimen of the *genus* "capitalist" but of the cautious gambler.

It appears a remarkable thing to me that Mr. Maxwell, with all the facilities he mentions for building a flying machine, does not build it at his own expense, knowing that on account of the said superiority he would easily be able to repay twice over any small loan he might negotiate ; that he does not do so, but seeks to share the risk, does not show overwhelming belief in his invention, or ability to grapple with attendant difficulties.

In conclusion I would point out that there are better ways of attracting capitalists than by grumbling at their coyness in the technical papers.

Yours truly,

Horsham. P. S. HOLDSWORTH.

To the Editor of FLIGHT.

SIR,—I venture to endorse the remarks of your correspondent who signs himself "Clayton," regarding this affair of aerial flight; still I would like to ask the question, why our inventors have to go to foreign shores to find the support for their ideas? Speaking from their standpoint, there are no buyers in England for their brains, but obviously there is a market for such in America or Germany; consequently we see so frequently in all branches of industry, foreign inventions which have actually emanated from Britishers' inventiveness. Under these circumstances you could not brand me as a "Little Englander" were I to sell my ideas to these foreigners.

As a matter of fact England of to-day forces the English inventor to the foreign market, therefore he is helpless in the matter.

By the peculiar chain of circumstances, the ingenious and far-sighted foreigners are aware that by demanding our coin they have at the same time the first call upon our brains. It is all so easily seen through, that it seems strange to me personally, that we are not aware of this sad state of affairs. These gentlemen may well laugh when they see "Old John Bull" so apathetic and indolent in these important matters which so seriously concern him, particularly as it applies to the very near future.

The foreigner is all-powerful, he tells us that we must do certain things, and perforce we *have* to do them, whether we like it or not. I will name a few to mind at the moment, viz. :—

Make our paper from his wood and machinery.
Print our newspapers with *his* paper and machinery, not the paper which he has allowed us to make with his wood and machinery as above mentioned.
Make our matches, boots and numerous other things with his appliances.
Use his electric light for our lighting requirements.
Make the same with his appliances, &c.
Adopt his methods for our shipping.
Adopt his electric trams, motors, &c. Adopt his office systems, &c.

In fact I could go on for a whole week enumerating the dictums of the foreigner, all of which we have to abide by because there is no market in England for British brains.

This is a matter which has nothing whatever to do with the fiscal subject, it concerns only this fact, that there is *no market in England for the English inventor*.

We are now being told that for the future we have got to fly in the air, and as sure as fate we will have to, because the foreigner assures us that he has some airships and aeroplanes which he wants to sell to us. He already knows that we cannot make them for ourselves, because he has the inventiveness of the world at his finger tips; furthermore he knows that the Britisher is fattened out with his wealth, and is only concerned about what best he can do with it; nothing else is worth while.

It is a lamentable state of things for England; still we have the satisfaction of knowing, if satisfaction it be, that most of this foreign ingenuity we notice on every side emanates from British resource abroad. In common fairness we have to admit that the foreigner is entitled to the benefits accruing from his making a market for what British brains can do for him in this direction.

In the face of these facts, I would ask the question—are we entitled to fly?

I remain, Sir, yours faithfully,

Ewell. AMBITIOUS.

MODEL FLYERS—A CHALLENGE.

To the Editor of FLIGHT.

SIR,—I shall be very pleased to try one of my rubber-driven "Flyers" against Mr. Kay's model if he will suggest a time and place.

Yours faithfully,

Surbiton. T. W. K. CLARKE.

To the Editor of FLIGHT.

SIR,—With reference to the challenge of Mr. Montford Kay for a machine to fly against his, he does not say in his letter what size the machine is to be. We have a machine after the Wright model with two propellors, which we are safe in saying you cannot make a mistake in launching. If you start it purposely the wrong way, it will immediately right itself, and flies better against the wind than with it.

We should be very pleased to accept Mr. Montford Kay's challenge if he will give us further particulars. He would perhaps like to see our machine before he accepts it. We shall be very pleased to show it to him at the undermentioned address. We think we are safe in making the statement that there is no model flyer on the market that can compare to the consistent flights of our latest model, which we sell at three guineas.

We were the first in Great Britain to put on the market model aeroplanes for sale on a large scale, and we have a dozen different kinds, each one of them guaranteed flyers, so that it may interest your readers to know that everything of the latest in model aeroplanes can be bought from

Yours truly, NEW-THINGS, LTD.
CECIL STREETER, Gen. Manager and Sec.
38, Berners Street, Oxford Street, W.

MODELS.

To the Editor of FLIGHT.

SIR,—In answer to Rev. A. E. Watson's enquiry *re* elastic as a motive power for models, and size of machine to which it can be applied. My machine weighs 14½ lbs. complete; it is driven by two elastic motors 6 ft. long, weighing 4½ lbs., driving two aluminium propellers similar to Hollands' type.

The machine runs on three wheels, and will lift off level grazing ground, against the wind, by pushing off and releasing power at same time.

The elastic I use is ¼ in. diameter solid cord, supplied by Messrs. Moseley and Sons, Manchester, at 15s. 4d. per lb. This is the best to be had.

Yours sincerely,

Cheltenham. S. ELLIOT.

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